Periapical Radiography

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Main Indications

• Detection of Apical infection/inflammation
• Assessment of the periodontal status
• After trauma
• Assessment of Unerupted teeth
• Assessment of tooth morphology
• During Endodontics
• Pre and post operative assessment of apical surgery
• Detailed evaluation of apical cysts and other lesions within the alveolar bone
• Evaluation of implants postoperatively.
Ideal Positioning

• Tooth and film in contact or as close as possible
• Tooth and film packet parallel
• Film packet *vertical for anteriors*, horizontal for posteriors
• X-ray beam to meet film/tooth at right angles
• Position should be reproducible
The Ideal Scenario

Sufficient film to record the apical tissues

Parallel X-ray beam meeting both the tooth and film at right angles

Film and tooth parallel and in contact
Radiographic Techniques

The anatomy of the oral cavity does not always allow the ideal positioning to be used. Two techniques are possible to overcome the problem:-

1. The paralleling technique
2. The bisecting Angle technique
Paralleling Technique

• Film packet placed parallel to the long axis of the tooth under investigation
• X-ray tubehead aimed at right angles to film and tooth
• This allows reproducibility
• Satisfies 4 of the 5 criteria
The anatomy of the palate and shape of the arch may mean the film cannot be both parallel and in contact with the tooth.
The length of the spacer cone on the tubehead will have an effect on the magnification of the image.
Film Packet Holders

A variety of holders exist but all have the same components:-

1. A mechanism for holding the film packet parallel to the teeth that also prevents bending of the film
2. A bite block or platform
3. An x-ray beam aiming device
Positioning techniques

• Select appropriate holder and film
• Place smooth, white surface of film packet towards tubehead
• Embossed orientation dot is placed opposite crowns to avoid superimposition over apex
• Position patient with head supported and with occlusal plane horizontal
• Place film and holder in mouth as appropriate
• Rotate holder so that teeth under investigation touch the bite block
• Ask the patient to gently bite together to stabilise the holder
• Placement of a cotton wool roll on the reverse of the bite block may make the procedure more comfortable for the patient.
• The locator ring is adjusted to contact the patient's face.
• The spacer cone is aligned with the locator ring.
• The exposure is made.
Position of patient, film holder and tubehead for Maxillary Incisors
Diagrammatic set up for maxillary incisors
Radiographic Appearance of Upper Central Incisors

- Shadow of the tip of the nose
- Normal trabecular pattern
- Lamina dura
- Median maxillary suture
- Gingival soft tissue
- Radiolucent periodontal ligament space
- Pulp canal
Position of patient, film holder and tube head for maxillary canines
Diagrammatic positioning for Maxillary Canine
Radiographic appearance of Maxillary Canine

- Normal trabecular pattern
- Radiolucent periodontal ligament space
- Radiopaque lamina dura
- 2 roots of the first premolar superimposed
- Overlapping crowns
Position of patient, film, holder and tubehead for Premolar radiography
Diagrammatic positioning
Radiographic appearance of premolars
Position of film holder, patient and tubehead for maxillary molar periapicals.
Diagrammatic positioning for Maxillary Molars
Radiographic Appearance of the Maxillary Molars

- Zygoma
- Maxillary antrum
- Normal trabecular pattern
- Unerupted third molar

Floor of the antrum
Pulp canals
Position of film, holder, patient and tubehead for mandibular incisors
Diagrammatic positioning for mandibular incisors
Radiographic appearance of the mandibular incisors
Position of film, holder, patient and tube head for imaging the mandibular canines
Diagrammatic set up for manibular canines
Radiographic appearance of mandibular canines

- Enamel
- Pulp canals
- Radiolucent periodontal ligament space
- Orientation dot
- Cervical translucency or 'burn-out'
- Radiopaque lamina dura
- Normal trabecular pattern
Position of film, holder patient and tube head for imaging mandibular premolars
Diagrammatic representation of positioning for mandibular premolars
Radiographic appearance of mandibular premolars
Position of film, holder, patient and tube head for imaging mandibular molars
Radiographic appearance of mandibular molars
Bisected Angle Technique

Theory

1. The film packet is placed as close to the tooth under investigation as possible without bending the packet

2. The angle formed between the long axis of the tooth and the long axis of the film packet is assessed and mentally bisected
The x-ray tubehead is positioned at right angles to this bisecting line with the central ray of the x-ray beam aimed through the tooth apex.

Using the geometrical principle of similar triangles the actual length of the tooth in the mouth will be equal to the length of the image of the tooth on the film.